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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,351	10/22/2003	Peter Scott Andrews	P0289US2	8530

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EXAMINER

LEE, EUGENE

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/692,351

Applicant(s)

ANDREWS ET AL.

Examiner

Eugene Lee

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-17 and 19-26 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-10, 12-17, 19-26 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 thru 5, 8, 16, 17, 19, 20, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe 3,760,237 in view of Gramann et al. 5,907,151. Jaffe discloses (see, for example, Fig. 3) a light emitting die package comprising a circular metal support header (substrate) 11, conical light director (reflector plate) 22, and lens 26. Jaffe does not disclose a thermally conductive, electrically insulating film, a first conductive element on said insulating film, and a second conductive element on said insulating film, wherein at least one of said first and second conductive elements comprises a mounting pad for mounting a light emitting die thereon. However, Gramann discloses (see, for example, FIG 1) a light emitting die package comprising a body (light-emitting diode) 1, carrier plate 7, insulating layer (thermally conductive, electrically insulating film) 15, electrically conductive terminal track (first conductive element) 13, electrically conductive terminal track (second conductive element) 12, and underside contact (mounting pad) 22. The insulating layer, electrically conductive tracks, and underside contact provide connections on the carrier plate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have a thermally conductive, electrically insulating film, a first conductive element on said insulating film, and a second

Art Unit: 2815

conductive element on said insulating film, wherein at least one of said first and second conductive elements comprises a mounting pad for mounting a light emitting die thereon in order to provide connections to the substrate.

Regarding claim 3, see, for example, column 2, lines 62-66, wherein Jaffe discloses the viscous material should be transmissive to light and may be silicon rubber.

Regarding claim 4, see, for example, column 6, lines 10-12, wherein Gramann discloses the electrically conductive terminal tracks composed of aluminum (metal traces).

Regarding claim 8, Jaffe in view of Gramann does not disclose said insulating film comprising a ceramic polymer film. However, it would have been obvious to one of ordinary skill in the art at the time of invention to have said insulating film comprising a ceramic polymer film in order to protect the substrate. Also, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice (In re Leshin, 125 USPQ 416).

Regarding claim 26, see, for example, FIG 1, wherein Gramann discloses a connecting conductor (metal lead) 26.

3. Claims 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe '237 in view of Gramann et al. '151 as applied to claims 1-5, 8, 16, 17, 19, 20, 25, and 26 above, and further in view of Carey et al. 6,274,924 B1. Jaffe in view of Gramann does not disclose said substrate comprising a metal selected from the group consisting of copper and aluminum, and a copper/aluminum alloy. However, Carey discloses (see, for example, 2, lines 49-58) a slug (substrate) 10 comprising a material such as copper, aluminum, and alloys thereof. Therefore, it

Art Unit: 2815

would have been obvious to one of ordinary skill in the art at the time of invention to have said substrate comprising a metal selected from the group consisting of copper and aluminum, and a copper/aluminum alloy in order to adequately stabilize a light emitting diode on a substrate.

4. Claims 9, 10, 12, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe '237 in view of Gramann et al. '151 as applied to claims 1-5, 8, 16, 17, 19, 20, 25, and 26 above, and further in view of Jory et al. 6,501,103 B1. Jaffe in view of Gramann does not disclose at least one via hole through said substrate. However, Jory discloses (see, for example, FIG. 7) a light emitting diode assembly comprising a substrate 3, and via hole 4 wherein the via hole is insulated by a layer from the pin 16. It would have been obvious to one of ordinary skill in the art at the time of invention to have at least one via hole through said substrate in order to provide further connections to the light emitting diode underneath the substrate.

Regarding claim 10, see, for example, FIG. 7 wherein Jory discloses the via hole being insulated by a layer wherein the layer covers the pin (conductive trace) 16.

Regarding claim 12, see, for example, FIG. 7 wherein Jory discloses a circuit board (thermally conductive insulating film) 2, and solder (third electrical lead).

Regarding claim 13, Jaffe in view of Gramann does not disclose an external heat sink coupled to said substrate. However, Jory discloses (see, for example, FIG. 7) a light emitting diode assembly comprising a substrate 3, and circuit board (external heat sink) 2. It would have been obvious to one of ordinary skill in the art at the time of invention to have an external heat sink coupled to said substrate in order to dissipate heat and have further connections in the semiconductor device.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe '237 in view of Gramann et al. '151 in view of Jory et al. 6,501,103 B1 as applied to claims 9, 10, 12, and 13 above, and further in view of Kuwabara 6,124,635. Jaffe in view of Gramann in view of Jory does not disclose said substrate having a bottom side plated with metals for coupling with said external heat sink. However, Kuwabara discloses (see, for example, column 9, lines 20-24) plating a metallized layer so they can be joined to a heat sink. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have said substrate having a bottom side plated with metals for coupling with said external heat sink in order to stabilize a bottom side with a heat sink.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe '237 in view of Gramann et al. '151 as applied to claims 1-5, 8, 16, 17, 19, 20, 25, and 26 above, and further in view of Maekawa 6,281,435 B1. Jaffe in view of Gramann does not disclose at least one conductive element extending from the mounting pad to a side of said substrate. However, Maekawa discloses (see, for example, FIG. _1) a light emitting package comprising electrodes (conductive element) 3a, 4a that extend to the side of the substrate 2. It would have been obvious to one of ordinary skill in the art at the time of invention to have at least one conductive element extending from the mounting pad to a side of said substrate in order to make a connection underneath the substrate.

Art Unit: 2815

7. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe '237 in view of Gramann et al. '151 as applied to claims 1-5, 8, 16, 17, 19, 20, 25, and 26 above, and further in view of Mills et al. 6,525,386 B1. Jaffe in view of Gramann does not disclose said lens comprising a trough. However, Mills discloses (see, for example, FIG. 5B) a light emitting package comprising a trough 552. Mills discloses (see, for example, column 6, lines 9-12) the trough avoids pressure necrosis. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have said lens comprising a trough in order to avoid pressure necrosis.

8. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe '237 in view of Gramann et al. '151 as applied to claims 1-5, 8, 16, 17, 19, 20, 25, and 26 above, and further in view of Butterworth et al. 5,847,507. Jaffe in view of Gramann does not disclose said lens comprising frequency shifting compounds. However, Butterworth discloses (see, for example, Figure 2) a light emitting package comprising a die 110 and lens 240. In column 4, lines 34-44, Butterworth discloses the lens having fluorescent dyes (frequency shifting compounds). It would have been obvious to one of ordinary skill in the art at the time of invention to have said lens comprising frequency shifting compounds in order to have a relatively efficient way to produce various colored LEDs.

9. Claims 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jaffe '237 in view of Gramann et al. '151 as applied to claims 1-5, 8, 16, 17, 19, 20, 25, and 26 above, and further in view of Barnett et al. 6,541,800 B2. Jaffe in view of Gramann does not disclose

Art Unit: 2815

said lens comprising diffusant. However, Butterworth discloses (see, for example, column 6, lines 15-18) a lens comprising dispersants (diffusants). It would have been obvious to one of ordinary skill in the art at the time of invention to have said lens comprising diffusants in order to diffuse the outputted light.

Regarding claim 24, Jaffe in view of Gramann does not disclose said lens comprising a phosphor. However, Barnett discloses (see, for example, column 6, lines 20-24) a lens comprising phosphor material (a phosphor). It would have been obvious to one of ordinary skill in the art at the time of invention to have said lens comprising a phosphor in order to generate white light when excited with a blue, ultraviolet, or other color LED.

Response to Arguments

10. Applicant's arguments filed 8/25/05 have been fully considered but they are not persuasive.

Regarding the applicant's argument on page 9, third paragraph of the response and amendments filed 8/25/05 that the cited references do not offer any reasons for which they should be combined, this argument is not persuasive. The Examiner recognizes that references can not be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. In re Nomiya, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. In re McLaughlin, 170 USPQ 209 (CCPA 1971) references are evaluated by what they suggest to

Art Unit: 2815

one versed in the art, rather than by their specific disclosures. In re Bozek, 163 USPQ 545 (CCPA 1969). In this case, Jaffe and Gramann both disclose a light emitting diode surrounded by a U-shaped structure, however, Gramann further includes a thermally conductive, electrically insulating film, first conductive element, second conductive element, and mounting pad of Gramann which provide connections to a substrate. Such a modification provides an external connection from the light emitting diode to other regions of a semiconductor device. The applicant's argument that Gramann reference teaches etching a recess 8 into a cover plate to place its semiconductor die 1 wherein walls of the substrate 7 surrounds semiconductor die 1, and Jaffe teaches, in contrast, fabricating an alleged reflector plate about a flat substrate 11 where the alleged reflector plate surrounds its diode 12 is not persuasive. The method of manufacture does not deter from the fact that both Jaffe and Gramann disclose the same structure of a light emitting diode surrounded by a U-shaped structure. Therefore, even though Jaffe and Gramann disclose a different method of forming the U-shaped structure, the structures formed therein is generally the same, and that it would still have been obvious to include the thermally conductive, electrically insulating film, first conductive element, second conductive element, and mounting pad of Gramann for the aforementioned reasons.

Regarding the applicant's argument on page 10, first paragraph that neither of the alleged conductive elements comprise a mounting pad, this argument is not persuasive. In FIG 1, Gramann discloses an underside contact (mounting pad) 22 that is comprised from the second conductive element 12.

Regarding the applicant's argument on page 10, fourth paragraph that the alleged reflector plate of the Jaffe reference does not and cannot teach the reflector plate, this argument

Art Unit: 2815

is not persuasive. In column 3, lines 42-49, Jaffe discloses the conical light director (reflector plate) reflecting light emitted from the diode 12. Therefore, the conical light director is a type of reflector plate since Jaffe clearly discloses its ability to reflect light.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

INFORMATION ON HOW TO CONTACT THE USPTO


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733. The examiner can normally be reached on M-F 8-5.

Art Unit: 2815

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eugene Lee
October 26, 2005

A handwritten signature in black ink, appearing to be 'Eugene Lee', written in a cursive style.